# Rapid Response — An Innovative Contract Mechanism Model

## Sustaining Manufacturing Affordability

TERRY PHILIPPI • OSCAR GOMEZ

An innovative mechanism achieves quick turnaround contractual authorization for small tasks requiring immediate action. Referred to as "Rapid Response," it provides short-term and immediate technical assistance to weapon system primes and precision gear manufacturers.

The Rapid Response mechanism evolved directly from a request the Instrumented Factory for Gears (INFAC) received from Bell Helicopter Textron, Inc., Fort Worth, Texas, to provide immediate technical assistance for a research and development (R&D) experiment they were in the midst of conducting. Bell needed an answer promptly, and INFAC needed a quick way to respond within the structure of the contract.

INFAC's sponsor, the U.S. Army Aviation and Missile Command (AMCOM), and the INFAC contractor worked together to devise a method that provided the flexibility that INFAC needed while allowing AMCOM to maintain programmatic control. INFAC is operated by the IIT Research Institute (IITRI), a wholly owned subsidiary of Illinois Institute of Technology (IIT), in Chicago, Ill. The U.S. Army Manufacturing Technology (ManTech) Program provides sponsorship.

ManTech is the broad discipline that develops or improves processes on the factory floor that enable the production of the products that constitute military weapons and equipment. More specifically, the ManTech discipline encompasses the development of manufacturing process technologies and business practices necessary for a sustainable industrial base for the production of high-quality, affordable Army material.

### Evolution of Rapid Response

According to Wayne Scott, Chief Manufacturing Engineer at Bell Helicopter Textron, "I was familiar with INFAC and their goals...and was quite familiar with their shop...on the campus at IIT. We needed help in a couple of different projects – prototype parts for some development activities – and talked with INFAC about the possibility of doing that work in their facility, where we could minimize the impact to our production facility here.

VIEW OF THE MAIN SHOP FLOOR, INSTRUMENTED FACTORY FOR GEARS (INFAC), ILLINOIS INSTITUTE OF TECHNOLOGY (IIT) RESEARCH INSTITUTE (IITRI), CHICAGO, ILL.

*Philippi is the Manager, Industrial Extension, Manufacturing Technology Department, Instrumented Factory for Gears (INFAC), Illinois Institute of Technology (IIT) Research Institute (IITRI) in Chicago, Ill. Gomez is an Aerospace Engineer with the U.S. Army Aviation and Missile Command (AMCOM), Redstone Arsenal, Ala. He is also the AMCOM Project Engineer for the INFAC Program.*



Digitized photo courtesy Illinois Institute of Technology

"...Their charter," Scott said, "is to advance the state of art of manufacturing gears, so consequently they have some of the gear equipment that is needed...on some development work we were doing."

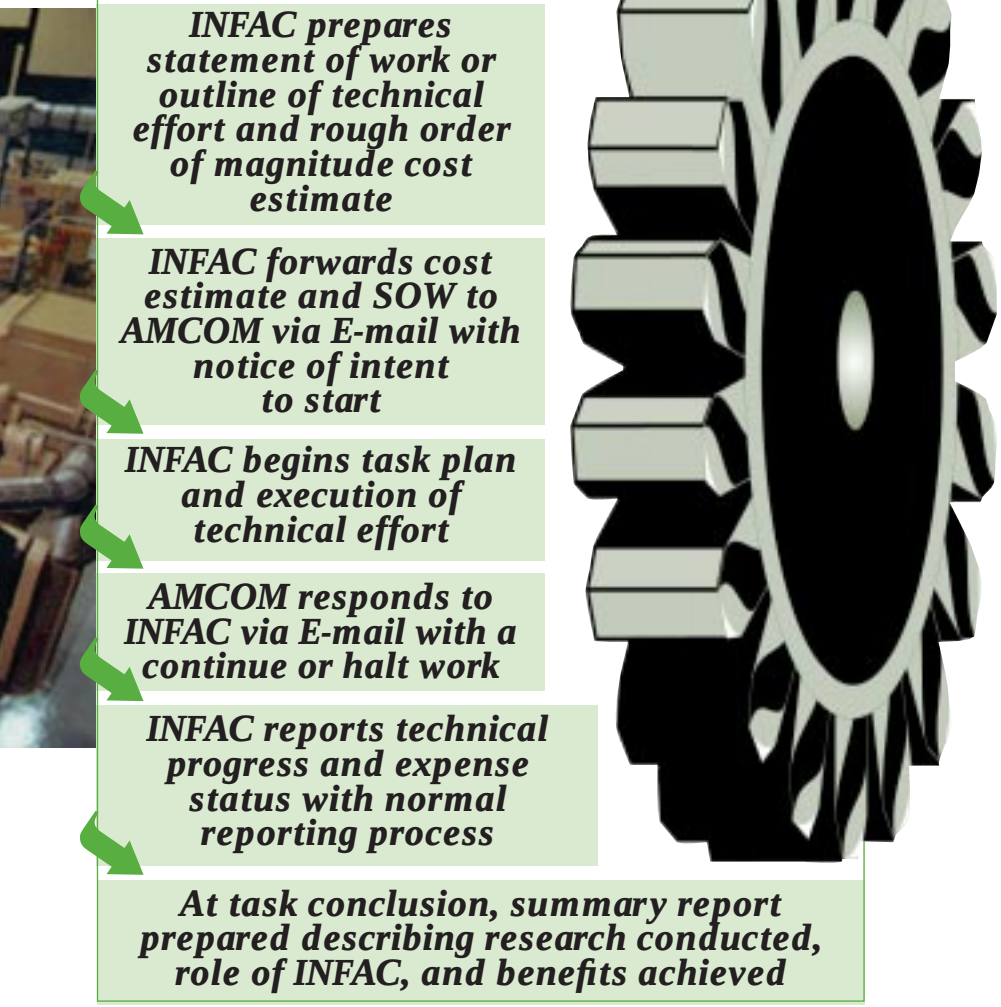
According to Dr. John Cesarone, INFAC Program Manager, IITRI, "Someone such as Wayne Scott would come to me...and say, 'I really need something done quick,' and it might be one month's worth of work, but if I want to do it, I have to go to the Army, write up a statement of work, and go through the entire approval process. By the time we get it approved, the company has either lost interest or had to settle for a suboptimal approach to solving the problem. INFAC has lost the window of opportunity to support Army supply needs."

Essentially, Rapid Response allows the INFAC contractor to perform small tasks for DoD precision gear producers, practically on an "as received" basis, without going through an extensive and cumbersome contracting process. Typically, the client for Rapid Response would be an organization that currently is or has been an INFAC industry partner for other experimental activities.

The Army has established a separate Contract Line Item (CLIN) for the Rapid Response Program, with an available funding threshold for providing INFAC support to these types of projects. "We would put a certain amount of money aside in a little funding CLIN," said Cesarone, "and the government would give us, as the program managers, the authority to make a snap judgment if a project is within scope.

"According to the subcontract that lets us do this, they have the right to call us back and say, 'No, we do not think that is within scope – stop'; but we still have the right to be reimbursed for any cost that we incurred. So everyone is protected.

"To date it has never happened...as contractors we have a very good rapport with our government customer to agree on what is good and bad, what's not appropriate, etc."




Rapid Response Flow Process

## Rapid Response Specifications

The primary criteria for accepting tasks under Rapid Response follow:

- The task must be within the INFAC scope of work.
- The total cost of an individual task must not exceed $15,000.
- The funding must be currently available within the CLIN.

The flow chart on the first page of this article illustrates how the process works. Initially, INFAC receives a request for technical assistance from a manufacturer and determines if the request is within their contract scope. If so, the next step is to prepare a technical plan and a rough estimate of the cost. If the project is within the INFAC program objectives and cost ceiling, INFAC forwards the information to AMCOM via E-mail, and prepares an experimental plan to initiate the project. AMCOM then responds, also via E-mail, with direction to continue or stop work.

Reporting of technical progress and status of expenditures must meet INFAC reporting process guidelines. By definition, a short-term project should take three to 18 weeks to complete. At the conclusion of the task, a summary report describes the research conducted, what the role of INFAC was, the technical results, and the Army benefits achieved.

Within the INFAC scope of work, the requirements for manufacturing technology tasks encompass the entire spectrum of precision gear manufacturing technology. The program achieves a balance of application-oriented work directed at solving immediate problems, and generic research directed at increasing the stock of knowledge concerning gear manufacturing processes.

Many excellent reasons might motivate a manufacturer to seek the help of INFAC through Rapid Response: experience and technical expertise of the INFAC staff tops the list. As part of the Manufacturing Technology Department of IITRI, the INFAC staff has been conducting R&D for the gear and aerospace industries for over 20 years.

A particular strength of the INFAC team at IITRI is an in-depth understanding of not only the technical problems of DoD precision gear manufacturers, but an understanding of the operational issues as well. The INFAC program has been responsible for the factory-wide modeling and simulation of seven precision gear plants. INFAC's staff are familiar with the shop floors of over 50 North American gear producers and over 20 off-shore producers.

Another key advantage of the INFAC Rapid Response Program to industry is that it provides an unbiased and objective source of experimental data. Also, it provides use and access to equipment or resources that may not be available internally to a company. R&D assets are often unavailable within a factory environment dedicated to production. Rapid Response is a great way to support and facilitate concurrent engineering for weapon system production without interruption of day-to-day operations.

***Rapid Response allows the INFAC contractor to perform small tasks for DoD precision gear producers, practically on an "as received" basis, without going through an extensive and cumbersome contracting process.***

INFAC can offer Rapid Response users both physical testing capabilities of the INFAC shop-floor and facility manufacturing engineering "know-how." INFAC engineers can draw upon their R&D and manufacturing experience to provide assistance in the development, routing, and anticipated results of using a particular gear manufacturing process or process sequence.

Examples of the types of technical assistance INFAC might provide include several diversified areas:

- Assistance in Pre-Production Process Development
- Rapid Fabrication of Prototype Parts
- Prototype Development
- Providing Independent Validation and Documentation of a New or Established Manufacturing Process
- Characterization of Either Conventional or Advanced Materials
- Verification of Testing

Still other types of manufacturing operational assistance might include providing help and engineering support in the following areas:

- Data Analysis
- Internal Training
- Process Modeling
- Fixture Design
- Material Selection
- Process Planning
- Analysis of Gear Manufacturing Operations for Application of INFAC Technology

Within the first year of the Rapid Response mechanism, INFAC successfully completed several tasks. These tasks included the development of prototype parts in support of two R&D experiments and the analyses of three DoD gear manufacturing process issues.

INFAC's Technical Advisory Board members include representatives from each of the four Army helicopter primes and key Army precision gear suppliers. The Board members are personally familiar with this innovative program, which could serve as a model for similar organizations.

## Model Program

According to Ronnie Chronister, Chief of the Manufacturing Technology Division at the U.S. Army Aviation and Missile Command, Redstone Arsenal, Ala., "It's a good mechanism to link the...manufacturing technology development...to some application. I think it's a good concept. The way it's worked up to now has been that, generally, projects are one to...three years...before we can actually apply them on the manufacturing floor.

"This is going to allow us...to better meet the needs of our customers...the PMs, and allow us to be more of an...influence in the affordability of the weapons system. ...That's the whole point of the programs to develop manufacturing technology...make weapons

systems more affordable. That's what we are trying to do in the ManTech world...become a pillar of affordability for weapons systems and their development.

"I...think that the benefits that come out of this Rapid Response program will give ammunition to developing sources of funding to develop similar types of programs for other projects. It could be used as a model."

Advising others interested in using Rapid Response as a model, Cesarone said, "I would say if someone else wanted to try this mechanism on another contract, the way we structured it you really can not get hurt. The fact that we know them well, and they are willing to trust us enables the project to happen, and perform, and go on to conclusion quickly. If that broke down, if someone tried this and the contractor really did not understand the customer's needs or the customer did not quite trust the contractor, no one would get hurt, because the whole Rapid Response program mechanism has safeguards in it.

"If I guessed wrong and started a project they didn't like me to do, or if they didn't trust me and thought I was doing it for the wrong reason, either way they could say 'No, don't proceed on this,' and their exposure is minimal. I send them an E-mail on the day that I start. If they got it that day and did not like it, they could tell me to stop and the most they would be exposed for is one day's worth of labor. I would not be at risk for that, because I know I am reimbursable until they tell me 'no.'

"So, neither of us is risking much. If somebody wanted to try this sort of thing, that is the worst that could happen. If that happened once or twice, hopefully it would be a learning experience, and they would develop that rapport where they would never have an aborted start. We have been lucky that we have never had an aborted one at all, because we did not do this until we had a good rapport.

"I would say this mechanism works as long as a contractor fully understands the real needs of his client," said Cesarone, "...and if the government client fully trusts the judgment of the contractor."

"The big thing, absolutely, is communication." According to Scott, "...When they run into problems in the development phase of these things, the communication coming back needs to be very quick. That way both parties can respond to the difficulties quickly."

Cesarone agrees, and adds, "I would say communication at a high level. I think the government and their contractors on large programs have very good communications at a low level, meaning they send lots of E-mail back and forth, lots of letters, statement of work, and...tons of paper. But they rarely achieve a meeting of the minds.

"...I have people in their factories all the time from my shop. Our job is to know their needs, and we're always going out there and making this an offer to them." We remind them about this mechanism and they love it...I would say that everyone I have dealt with has been very positive about it."

"Our project was successful," said Scott. "We were very pleased with the results of it. We had some start-up problems, and some communications problems. Once we were able to get all that lined out, we were very happy with the program...being able to look at some development activities, relative to some prototypes, very quickly."

### Working Together Pays Off

In summary, the INFAC program plays an important role in ensuring a viable supply base to support both the sustainment of current weapon systems and the manufacturing affordability of future systems. The Rapid Response Program is just one example of how INFAC and AMCOM Engineering are working closely with the DoD supply base to help meet the challenges of fleet sustainment and weapon system affordability.

## Acting DDR&E Announces Senior Leadership Appointment

George T. Singley III, Acting Director, Defense Research and Engineering (DDR&E), Department of Defense, recently announced the appointment of Dr. Robert J. Trew to the DDR&E Pentagon staff, effective August 17, 1997.

Trew is a newly appointed Senior Executive Service member, and is serving as the Director for Research. He brings a wealth of knowledge and expertise to the Department of Defense (DoD) from his extensive accomplishments as an active researcher for over 25 years, extensive involvement in university and government issues, and numerous peer-reviewed publications and patents. A member of many professional societies, Trew is also a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

As a member of the DDR&E Pentagon staff, Trew will play a key senior leadership role in DoD's science and technology program.